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The old adage “everyone complains about the weather, but no one does anything about it” may soon fall by the wayside, thanks to the quality of data from NASA’s new “thermometer in the sky”—a suite of three advanced weather instruments aboard the Aqua spacecraft.

“First-light” images from the instruments—the Atmospheric Infrared Sounder (AIRS) spectrometer and its two companion instruments, the Advanced Microwave Sounding Unit and the Humidity Sounder for Brazil—are exceeding expectations of the world meteorological community. The result, project scientists say, should be an ability to nearly double the accuracy of short-term weather predictions by this time next year, substantially improving our ability to track severe weather events—such as hurricanes—and advance climate research.

“This experiment will capture, for the first time, a continuous, detailed picture of Earth’s atmosphere for use in global weather prediction and climate studies,” said JPL’s Dr.

Moustafa Chahine, experiment science team leader “The instruments are in excellent health and are ready to serve NASA, the National Oceanic and Atmospheric Administration and the broader climate research community.”

The first-light images may be found at www.jpl.nasa.gov/airs.

The AIRS experiment, with its visible, infrared, and microwave detectors, provides a three-dimensional look at Earth’s weather. Working in tandem, the three instruments can make simultaneous observations all the way down to the Earth’s surface, even in the presence of heavy clouds. The 2,400-channel multispectral AIRS system will be used to map the three-dimensional global distribution of temperature, moisture and clouds. The primary objectives are to improve the accuracy of weather forecasts and to study climate change.

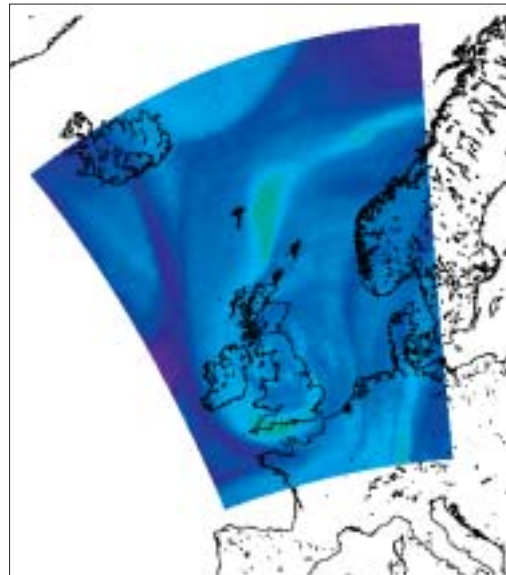
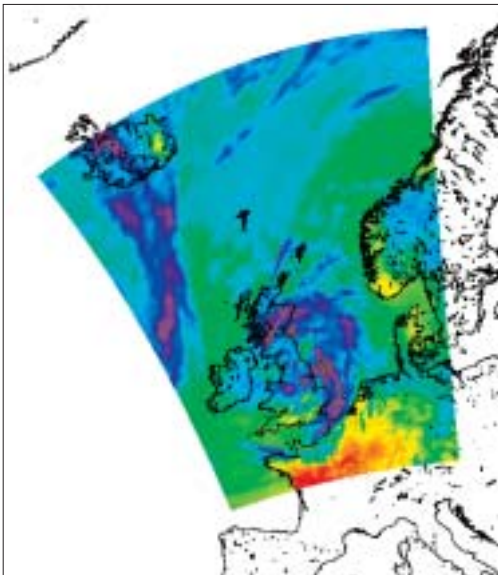
The infrared and microwave data from AIRS/AMSU/HSB are integrated to retrieve a single set of temperature, moisture and cloud values.

Chahine said the key to increasing the useful range of weather forecasts from the current two to three days to five days is to observe today’s weather with much higher accuracy.

“The accuracy of computer models is dependant upon the quality of today’s weather information,” he said. “Our experiment will effectively multiply our existing global armada of 4,000 weather balloons by 100, giving us global coverage over land and sea from space with the same data quality. This additional data will dramatically reduce errors that have traditionally limited the range of current weather forecast models.”

Experiment data is also expected to allow meteorologists to plot the path of hurricane landfalls within 100 kilometers (62 miles) up to three days in advance, saving lives and property and enabling better mobilization and deployment of resources and emergency personnel.

Climate research applications include the study of global carbon dioxide distribution and better understanding interrelationships between weather and climate.



“If we can determine changes in rainfall patterns and amounts, we can better understand the global water cycle and its implications for managing fresh water resources,” said Claire Parkinson, Aqua project scientist at NASA’s Goddard Space Flight Center, Greenbelt, Md. “Improved temperature predictions will allow commerce to move merchandise and fuel where needed to meet cold or warm weather demands. Other industries strongly dependent on weather include aviation, transportation and agriculture.”

The experiment recently completed calibration and is now transmitting continuous, uninterrupted data to the project science team and NOAA. Instrument validation will continue through next June, as NOAA evaluates the new data set, learns how to integrate it and gains confidence in its accuracy.

Following instrument validation, the data will be integrated into existing weather prediction models by NOAA’s National Centers for Environmental Prediction and six of the world’s leading weather prediction centers. The data will also be distributed to the World Meteorological Organization in Switzerland, where it will be made available to 105 countries.

JPL manages the AIRS experiment for NASA. The AIRS Instrument was built by BAE Systems for JPL. NASA’s Goddard Space Flight Center provided the Advanced Microwave Sounding Unit, which was built by Northrop Grumman. The Brazilian Institute for Space Research provided the Humidity Sounder for Brazil, which was built by Astrium.

Launched May 4, 2002, Aqua’s six-year mission will collect data on global temperature variation and cycling of water, studying global precipitation, evaporation, changes in ocean circulation and how clouds and surface water processes affect climate. The information will help scientists better understand how global ecosystems change and how they respond to and affect global environmental change.

First AIRS images exceed expectations

By Alan Buis

Left image is from an infrared channel that measures the surface temperature in clear areas and cloud-top temperatures in cloudy areas, revealing very warm conditions in France and a storm off the east coast of England. Image at right represents a microwave channel that sees through most clouds and observes surface conditions everywhere. The images were taken July 20.

TOPEX celebrates 10 years of flight

Free ice cream will follow talks Aug. 15

Later this month JPL will celebrate the 10th anniversary of the launch of Topex/Poseidon, the ocean-observing mission that has helped revolutionize our understanding of Earth’s climate.

Talks by several principal members of JPL’s Topex/Poseidon team on Aug. 15 will be followed by free ice cream for JPL staff.

Charlie Yamarone, JPL’s Topex/Poseidon project manager and now deputy director of the Earth Science and Technology Directorate, will be joined by project scientist Dr. Lee-Lueng Fu and research scientist Dr. Bill Patzert from 11:30 a.m. to 1 p.m. in von Kármán Auditorium. Ice cream will follow in the mall.

A joint mission between NASA and the

French Space Agency launched from Kourou, French Guiana on Aug. 10, 1992 for what was then a three-year mission, Topex/Poseidon has been making precise measurements of sea-surface height continuously ever since. The first mission to map global ocean surface topography with sufficient accuracy for studying ocean circulation, Topex/Poseidon changed our view of the oceans forever. The social and economic benefits of the nine years of Topex/Poseidon observations include El Niño and La Niña forecasting, climate research, hurricane forecasting, marine mammal research, coral reef research, fisheries management, ship routing and offshore industries.

The mission has set the stage for Jason 1, a

joint U.S.-French mission managed by JPL that launched last December. Jason 1 and Topex/Poseidon are flying in tandem, doubling the science data return for as long as Topex/Poseidon remains in good health. Jason 1 will then assume Topex/Poseidon’s former flight path.

Through October, Jason science data will be distributed to the mission’s science team, and work will begin to conduct a precise scientific assessment of product quality through cross-calibration of Jason products with those of Topex/Poseidon. A science working team meeting will be conducted at the end of this six-month validation phase to verify that Jason data are accurate, correctly calculated and meeting program requirements.

News Briefs



Dr. Erik Antonsson



Martin Lo

Artist's rendering of the Interplanetary Superhighway.

Lab names chief technologist

The chair of the mechanical engineering department at Caltech, DR. ERIK ANTONSSON, has been named chief technologist at JPL. Antonsson has been a Caltech professor and researcher since 1984. He organized the Engineering Design Research Laboratory at Caltech and has made major research contributions in the area of formal methods for engineering design. He has been chair of mechanical engineering since 1998. He earned his bachelor's degree in mechanical engineering from Cornell University in 1976, and a doctorate in the same field from the Massachusetts Institute of Technology in 1982. Antonsson will join JPL in early September, and will also remain at Caltech as a professor of mechanical engineering. Until Antonsson begins at JPL, DR. LESLIE DEUTSCH will continue as the acting chief technologist to ensure a smooth transition.

Solar system 'freeway' envisioned

An "Interplanetary Superhighway" through the solar system resembling a vast array of virtual winding tunnels and conduits around the Sun and planets, as envisioned by JPL engineer MARTIN LO, can slash the amount of fuel needed for future space missions. Most missions are designed to take advantage of the way gravity pulls on a spacecraft when it swings by a body such as a planet or moon. Lo's concept takes advantage of another factor: the Sun's pull on the planets or a planet's pull on its nearby moons. Forces from many directions nearly cancel each other out, leaving paths through the gravity fields in which spacecraft can travel. To find the Interplanetary Superhighway, Lo mapped possible flight paths among Lagrange points—where one body's gravity balances another's—varying the distance the spacecraft would go and how fast or slow it would travel. Like threads twisted together to form a rope, the possible flight paths formed tubes in space. Lo plans to map out these tubes for the whole solar system. Lo and his colleagues have turned the underlying mathematics of the Interplanetary Superhighway into a tool for mission design called "LTool," using models and algorithms developed at Purdue University in Indiana. The



new LTool was used by JPL engineers to redesign the flight path for the Genesis mission to adapt to a change in launch dates. Genesis launched in August 2001. The work on the Interplanetary Superhighway for space mission design was nominated for a Discover Innovation Award by Discover magazine editors and an outside panel of experts. Utility signs tech affiliate agreement Consolidated Edison of New York (Con Edison) has turned to JPL to develop sensor technology to detect

and quickly analyze hazardous materials in the field. Using the best available commercial methods can take several hours of laboratory analysis to determine how to protect the environment and public when there is an environmental incident. Con Edison hopes to reduce that time to less than one hour. Con Edison recently signed a technology affiliates agreement and will work directly with JPL researchers to develop the sensors, which will search for two specific chemical families: polychlorinated biphenyl compounds, or PCBs, and perfluorocarbon tracers or, PFTs. PCB is a toxic chemical that was used to insulate high-voltage transformers. It also prevents pipes from rusting, adheres to any surface, tolerates extreme heat and does not degrade. Prior to 1970, all major utility companies used PCB oil in their transformers. The United States banned the use of PCBs in the early 1970s. "This is one example wherein the increased sensitivity of the JPL detection system translates directly into speed of detection and quantification," said DR. ARA CHUTJIAN, senior research scientist and leader of JPL's Atomic and Molecular Collisions Team. "This will be true in New York City. It will also be true for detecting other chemical vapors, such as explosives and nerve-agent detection at airports, harbors and in public buildings where speed is key in attaining security without impeding the commercial flow."

Cassini can see clearly now

Now within two years of reaching Saturn, JPL's Cassini spacecraft took test images of a star in mid-July that reveal successful results from an extended warming treatment to remove haze that collected on a camera lens last year. The quality of the new images is virtually the same as star images taken before the haze appeared. In the most recent treatment, the camera had been warmed to 4 degrees C (39 degrees F) for four weeks ending July 9. Four previous treatments at that temperature for varying lengths of time had already removed most of the haze. The camera usually operates at minus 90 C (minus 130 F), one of the temperatures at which test images were taken on July 9 of the star Spica. "We're happy with what we're seeing now," said Cassini Program Manager ROBERT MITCHELL. The team will decide in coming weeks whether to proceed with another warming treatment later this year.

Blood drive coming up

The next JPL/Red Cross Blood Drive will be held in von Kármán Auditorium on Aug. 13 from 10 a.m. to 4 p.m. and Aug. 14 from 7 a.m. to 1 p.m. Sign-up sheets will be available at Occupational Health Services, Building 310-202, prior to the blood drive. You may go directly to von Kármán at your preferred time if you were not able to sign up ahead of time. To sign up now, log on to http://eis/medical/blood_form.html. Occupational Health Services notes that the Red Cross is experiencing a critical shortage of all types of blood, and is appealing to all eligible donors for the August blood drive.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meetings are available. Call the Employee Assistance Program at ext. 4-3680 for time and location. Codependents Anonymous—Meets at noon every Wednesday. Call Occupational Health Services at ext. 4-3319.

Gay, Lesbian and Bisexual Group—Meets the first and third Fridays of the month at noon in Building 111-117. Call the Employee Assistance Program at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Tuesday, August 6

Investments Review—Roland Jacobson, Fidelity vice president of investment consulting, will speak from 2:30 to 4 p.m. in von Karman Auditorium. He will provide overviews of the economy, market and advanced asset allocation principles, and will discuss historical mutual fund performance. JPL Gamers Club—Meeting at noon in Building 301-227.

JPL Genealogy Club—Meeting at noon in Building 301-271.

Wednesday, August 7

Associated Retirees of JPL/Caltech—Meeting at 10 a.m. at the Caltech Credit Union, 528 Foothill Blvd., La Cañada. Tuesday, August 13 JPL Stamp Club—Meeting at noon in Building 183-328.

Tues.-Wed., Aug. 13-14

Investment Advice—One-on-one counseling appointments are available with TIAA-CREF. For an appointment, call (877) 209-3140, ext. 2614. Wednesday, August 14 JPL Amateur Radio Club—Meeting at noon in Building 238-543.

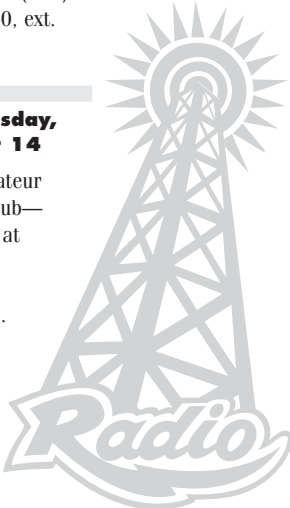
JPL Toastmasters Club—Meeting at 5 p.m. in the 167 conference room. Call Roger Carlson at ext. 4-2295 for information.

Thursday, August 15

Social Security —A representative will be available for one-on-one counseling. Call the Benefits Office at ext. 4-3760 for an appointment.

Friday, August 16

TIAA/CREF Enrollment—This monthly meeting, designed to assist employees newly eligible for Caltech/JPL Retirement Plan participation, will be held at noon in T1720-137.



ISO pre-assessment audit a success

A successful ISO 9001 pre-assessment audit was held at JPL July 16 to 18, as two auditors from National Quality Assurance reviewed the key areas of change between the 1994 and 2000 versions of the ISO standard. This resulted in three minor nonconformances and one observation. The auditors will return in late September for both a surveillance audit and the 9001-2000 transition audit. More details are available online at <http://iso.jpl.nasa.gov/resources/archives.html>. External ISO surveillance audits are held approximately every six months at JPL to ensure overall compliance and maintain the Lab's ISO certification. Every three years there is a renewal certification audit, which JPL successfully completed this past April. Now JPL is in the process of adjusting its management system to the revised ISO 9001-2000 standard.

Approximately 75% of the revised standard's requirements remain the same. Another 14% of the revised standards address work that JPL already does. Only 11% represent new areas that must be incorporated into the management system at JPL. The old standard focus was "Say what you do, do what you say, prove it" and emphasized individual tasks. The revised standard focuses on a big-picture view of a business and how it all works together to create a product. It has a far greater emphasis on management, customer satisfaction, performance measurement, and continual improvement. The pre-assessment audit in July addressed these new areas. The September external audit will address the entire standard. JPL also holds internal assessments conducted by Lab employees. The assessments are identical to an external audit, but occur over a longer period of time and penetrate more areas of the Lab. They identify areas that require improvement and prepare the Lab for the external audit. The assessments also give employees practice at what they might experience during an external audit and help familiarize people with the auditing process. If you have any questions, contact the ISO representative in your organization. A list of representative is available online at <http://iso.jpl.nasa.gov/help/list-orgreps.html>.

Canopy helps guards beat the heat

Vehicles pass through JPL's main gate beneath a newly installed canopy, built in support of the Lab's enhanced security measures. The 30-by-60-foot structure will serve as a semi-permanent location for security officers and will provide protection from heat and other severe weather conditions. Lights will soon be added, followed by a new gate house from which officers can store gear and perform badge checks.



Photo by Bob Brown /JPL Photolab

A dozen JPL employees recently gathered to commemorate their 40th year at JPL. Universe talked with five of the veterans to find out what life was like at JPL in the early 1960s, how the Lab has changed, and what they will remember most when they retire.

Hard Work, Good People, Exciting Times

by Mark Whalen

40-YEAR VETERANS DISCUSS THEIR CAREERS AT THE LAB

Joining the conversation are Charles Bryant, staff engineer in the Communications Ground Systems Section 333; Ab Davis, project manager of the Gravity Recovery and Climate Experiment (GRACE) mission; Alan Hoffman, a principal in the Reliability Engineering Office 513; Bob Polansky, deputy chief engineer and acting chief engineer of the Interplanetary Network Directorate; and Tom Shain of the Flight Systems Section 313, who currently provides logistics and facilities support to the Mars Exploration Rovers mission.

How did you come to stay at the Lab for 40 years?

BRYANT I am a native of Pasadena. At Oak Grove Park, I built and flew model airplanes, camped out with my Boy Scout troop, and played junior high school sports. Even though the general public was unaware of many of JPL's research projects, I reasoned that important things happened behind those gated fences, guarded by the military, and projected that I too, would work there one day. The continuing research, the scientific advances and my involvement with the Lab's achievements motivated and inspired me to remain.

DAVIS I arrived at JPL in June 1961 from Pittsburgh. Without anyone asking me "What are you going to do next?," I went to Disneyland and rode all of the E-Ticket rides. Needless to say, working at JPL for the last 40 years has been better than any E-ticket ride. I have gone from one interesting project to another, each time pursuing an objective that had never been achieved before.

HOFFMAN I enjoyed the work and the opportunities to support the efforts related to new and challenging missions. We were (and still are) doing things no one else in the world had done before.

POLANSKY I have always been excited about space and space missions. To be able to build systems that supported those missions and to participate in many of them in some capacity fulfilled my wildest ambitions.

SHAIN My brother Larry worked in the cable shop and I came

SHAIN The things we do here. There are very few places in the world that do what we do and do it as well as we do it.

Of all the projects you've worked on at JPL over the past 40 years, which have been the most exciting, the most memorable?

BRYANT As a mechanical designer in the Spacecraft Division, my first projects were to assist in the design of the main buss structure of the Mariner and Ranger spacecraft. The drawings were done by hand in those days, unlike the computer-aided design (CAD) generated drawings we create today. It was equally as exciting, as a mechanical engineer in Section 333, to assist in the detailed design and construction of the 70-meter antenna extension and the development of the 34-meter beam wave guide antenna at Goldstone.

DAVIS The GRACE mission. I've taken this project from the concept stage in 1992, through the competitive proposal process, development, and into mission operations with a successful launch from the Russian cosmodrome at Plesetsk in March of this year.

HOFFMAN All of the lunar and planetary missions were exciting for me. The project that brought me the most personal satisfaction was the Ranger 7 mission to the moon in 1964. It was the first successful project I had worked on and it made front-page news throughout the world during the height of the Cold War. I helped specify and implement the environmental testing program on the spacecraft hardware.

POLANSKY The most exciting for me was Surveyor, the first U.S. efforts to make soft landings on the moon. I was responsible for specifying, building, testing, and some operating of the data system that supported that mission set. One thing I'll never forget is when I was the first to see one of the

orientation we once had, something that needs to be restored. In addition, the Lab has become much more territorial than before (probably true of most organizations that have been around for an extended period of time).

SHAIN We didn't have near the amount of manpower and support back then. Over the years, we have sometimes learned the hard way, by making mistakes. It's now referred to as "Lessons Learned." I guess you could say that I have had 40 years of on-the-job training.

When do you plan to retire? When that day comes, what will be your best memories of JPL, the highlights of the experience? What will you miss the most?

BRYANT I'm planning to retire on Sept. 6, 2002. Most of all, I will miss the colleagues with whom I worked throughout the years at the Lab and I will miss the ongoing new learning experiences that are inherent in the job at JPL.

DAVIS I will retire as soon as we get the twin GRACE satellites operating at their full potential. This should be soon! The highlight would be, under rather contentious circumstances, Tom Gavin's statement "At JPL, we back our project managers."

I will miss working with some of the most talented people in the world: Charley Dunn (the best of the young talent I know) and Brooks Thomas (already retired), to name two of many.

HOFFMAN I have no plans to retire in the near future. The best memory will be the one that I am thankful to have been part of the first attempts by humankind to explore the universe robotically. We, and the machines we built, continue to make history.

I will miss the excitement and thrill of exploring some object in space for the first time with a machine I helped build and launch.



Photo by Dutch Slager / JPL Photolab

to join him. I built flight harnesses for eight months, then became a spacecraft flight technician. The opportunities kept coming to do more challenging and exciting things. So far, I've worked on 20 projects, including MER. It's been a dream come true, a wonderful 40-year experience.

What makes JPL so special?

BRYANT I have derived a great sense of pride and accomplishment in working for JPL, an organization that has done so much to further our knowledge of space, the galaxies beyond, and the universe, and to promote a deeper understanding of science in general.

DAVIS It is the people. The pool of talent never ceases to amaze me. The GRACE project was only possible because of the talented and creative people here. JPL has talented people who can solve a broad menu of problems—not only in the technical divisions but also in the administrative divisions and the Caltech Counsel's Office.

HOFFMAN JPL is a unique place to work. As a federally funded research facility, operated by a prestigious technical university for the nation's space agency, there is no other place like it in the world.

POLANSKY I enjoy being associated not only with space-related work, but also working so closely with my very prestigious alma mater, Caltech.

Surveyors land multiple times on the moon when the engines failed to turn off after the first landing. No one believed me at first when I announced, "the darn spacecraft was hopping around on the moon!"

SHAIN My favorite was Mars Pathfinder, for which I was a test engineer responsible for the electronics integration of the spacecraft. I was one of the last people to have my hands on the hardware, just prior to launch reaching inside the fairing to install a pyro battery completion connector. We worked many long hours but it was worth the payoff. What a fantastic success!

What is the biggest difference between today's JPL and that of 1962?

BRYANT In the earlier years the Lab built most of the spacecraft here at JPL, rather than contracting the work out.

DAVIS It's the tools of the trade. The tools that we have to do our job today are many orders of magnitude better than the tools we had in 1962. Also, the young talent at JPL today is better educated and more versatile than the talent pool at JPL in the '60s.

HOFFMAN The biggest difference is the number of flight projects that are in the development phase—in 1962 there were three programs: the Rangers; Mariners R and 1964; and Surveyors—in 2002 there are nearly 40.

POLANSKY In 1962, there was a much greater "can do" attitude at JPL. Today's JPL environment lacks the family

JPLers celebrating 40 years at the Lab gathered at recent ceremonies.

Front row, left to right: Raymond Prizgintas, Richard Emerson, Robert Hall, Charles "Rodger" Bryant. Back row: left to right: Tom Shain, James Johnson Jr., Robert Polansky, Alan Hoffman, Ronald Howe, Alvin Willems, Clayton La Baw, Ab Davis.

POLANSKY I plan on retiring in about a year. My best memories of JPL will always be the electrifying excitement associated with critical mission events I was involved with first-hand, not to mention the camaraderie with a large number of very smart, dedicated people.

What will I miss? Getting up too early to get to work and staying at work too late! And if you believe that, ...

SHAIN My plan is to retire after returning from the Cape following the launch of the two MER rovers next summer. The highlight of working here came in a trip up the hill to the Library shortly after I started here, where I met a very pretty young lady who later became my wife of 40 years.

I'll miss the companionship of the people—not only working cohorts, but also friends. Close friends. We worked hellish hours, but when you like the people you work with, the long hours are not near as painful and it makes the job fun.

Classified ads will be available the day before Universe is published, at

http://dailyplanet

JPL's online news source

View this and previous issues of Universe online

http://universe.jpl.nasa.gov

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Notice to Advertisers

Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser. Items may be combined within one submission. Ads must be submitted on ad cards, available at the JPL Store and the Universe office, Bldg. 186-118, or via e-mail to universe@jpl.nasa.gov.

Ads are due at 2 p.m. on the Monday after publication for the following issue.

All housing and vehicle advertisements require that the qualifying person(s) placing the ad be listed as an owner on the ownership documents.

Passings

HELEN MILLER, 87, a retired senior administrative secretary in Section 294, died of heart failure May 26.

Miller worked at the Lab from 1968–80. She is survived by three daughters, four grandchildren and five great grandchildren.

Services were private.

JAMES MACKINTOSH, 71, a retired staff assistant in Section 505, died of cancer June 14.

Mackintosh joined the Lab in 1961 and retired in 1996. He is survived by his wife, Marie; sons Randy and David; and four grandchildren.

Services were private.

ROBERT HANSEN, 84, retired staff administrative assistant, Reliability Engineering Section, died of natural causes July 5.

Hansen joined JPL in 1965 and retired in 1982. He is survived by his son, Eric.

Services were held at Sierra Madre Congregational Church.

FRANCIS NICHOLSON, 77, a JPL scientist whose precise navigation skills helped guide the Galileo spacecraft to Jupiter, died July 6 of a blood disorder at a New Jersey hospital.

Nicholson worked at JPL from 1975–96. He is survived by his wife, Jean; daughters Erica, Judy, Carol and Pat; sons Bob and Dan, two brothers, one sister and 11 grandchildren.

SAMESH MANTHA, 50, a senior propulsion engineer in Section 353, died of stroke July 19 at his home in Arcadia.

Mantha had worked at the Lab since 1991. He is survived by his wife, Padmaja, and daughters Priyanka and Poonam.

Services were private.

Classifieds

For Sale

BABY ITEMS: soft front carrier, Evenflo, \$7; car seat w/base, Century, rear-facing, \$40. bathtub carousel, Safety1st, \$7; all in superb cond., prices are obo; **COFFEE MAKERS:** Krups, 10-cups, white/gray, like new, \$40/obo; Braun, 10-cups, white/black, like new, \$30/obo. 626/791-6101.

BED, king, solid wood bed frame with 2 night-stands, vg cond., picture avail., must see, \$600/obo; mattress, very good quality, king, \$500/obo. 626/584-1164.

BED, antique oak & rod iron, queen size w/rails, \$80; **SKI SET**, used women's Head 170s, Gala radial & poles, Salomon boots, size 7 & bindings, see pictures @ERC, \$80. 626/744-9064.

BICYCLE, women's 20", Centurion Comp TA road bike equipped with Shimano 600 derailleur, etc., terrific cond., \$60. 956-3745, Steve.

BIKE SEAT, child's, Rhode Limo, good cond., includes rear rack, \$50; **MOUNTAIN BIKE**, Di-amondback Apex 1991 model, dark green, 21-speed, 20" frame, \$50; **CHILD CARRIER**, Kelly-Kids Country model, good cond., \$50. 626/794-8720, Andy or Lisa.

COMPUTER, Dell Dimension L566cx, Celeron 566, 66 GB HD, 512 MB RAM, 17" CRT, CD-ROM, internal Zip 100, Cambridge Soundworks speakers, MS Natural keyboard, Mini Tower, exc. cond., picture in the JPL Store, \$800/firm. 481-9591.

COMPUTER DESK, compact, on wheels, vertical design with room for large monitor, shelves top and bottom for PC and printer, pull out keyboard tray with pencil tray, pop up side shelf, wood color, good cond., bought for \$110 at Office Depot, barely used, sell for \$45/firm. 626/355-3657, Jason.

DESK, solid oak, 39 1/2" wide x 59" long, exc. cond., \$199/obo. 368-7861.

DODGER TICKETS, various games throughout season, 2 seats on Loge (orange) level near first base, call for list of games, \$23/ticket, parking not included. 626/296-1253.

FURNITURE: loveseat and ottoman, \$350; love-seat, Italian leather, \$450; dining set, corner nook, \$350, e-mail for pictures, sell separately or all for \$1,000/obo. dblijo7@yahoo.com or 626/535-9645.

GENERATOR, Craftsman, 6000-watt, w/cover & 5 ft., 30-amp extension cord, exc. cond., \$1,000/obo; **CARDIOGLIDE**, good cond., \$50; **RIMS**, Toyota 2000 Tacoma truck, stock w/hubcaps, exc. cond., \$500/obo; **RIMS**, Chevy El Camino, stock w/tires, good cond., \$500/obo. 899-7797.

KITCHEN DOORS, antique, early 1900s, 8 ft. tall, solid wood, beveled glass, from a large estate in South Pasadena, \$100/obo. 626/287-9433.

OPERA TICKETS, 2, Los Angeles Opera at the Dorothy Chandler Pavilion, "The Girl of the Golden West," with Placido Domingo, Sat., Sept. 7, at 7:30 p.m., mid-orchestra, Row R, Seats 21-22, \$256. 626/449-8392.

PIANO, upright, quite old but in good cond., \$500/obo. 626/584-1164.

PRINTER, Apple color StyleWriter 4100, almost new, needs ink cartridges, complete with software and cables, \$40/obo. 323/255-8635.

SOFA, exc. cond., \$350; **DINING SET**, table and 6 chairs, good cond., \$150; **RECLINER**, good cond., \$75; other items. 626/445-5071.

SOFA AND LOVE SEAT, good cond., beige, \$120/ obo; **VCR**, Samsung, 3 yrs. old, needs repair, broken belt on fast forward/plan mode, every-thing else works, \$40/obo. 626/794-4921, Bert.

SOFA SLEEPER, makes into qn. bed, abstract black, blue and mauve design, good cond., \$300; **BICYCLES**, 4, children's, need TLC, \$15/ea.; **LADDER**, metal, \$50. 626/357-8210.

TELESCOPE, 8", Meade, 2080 Schmidt-Cassegrain, with clock drive, equatorial wedge, tripod, 26 mm Meade Super Plossl eyepiece, viewfinder, white light solar filter, carrying case, \$700. 248-7331.

TYPEWRITER, IBM Wheelwriter, \$20. 626/585-8213.

VENDING MACHINES, table top, 9 slots, holds approx. 114 pieces of candy, manual, no elec., Nione (9) machines, \$1,000. 661/816-7799, Stan.

WINDOW AWNINGS, seven, metal, \$100/obo for set. 626/287-9433.

Vehicles/Accessories

'01 AUDI TT coupe, 225/quattro, performance package, Bose premium stereo option, 49K miles, raven blk, gray interior, excellent cond., \$29,900/obo or take over payments. 909/633-5117.

'89 BAYLINER Capri boat, 19 ft., 4 cyl., inboard/ outboard, very good cond., approx. 44 hours on engine, geat family ski/fish boat, am/fm/ cass., many extras incl. skis, vests, life jackets, etc., trailer has new tires, ready for summer, photo at www.mogensigns.com/boat.htm, \$6,500/obo. 352-4102.

'96 BMW 328i, Sport Package, white with gray leather, auto, 2.8L, 6 cyl., 83K mi., all power seats, PS, PW, PDL, CC, sunroof, dual temp controls, trip and maintenance computer and more, exc. cond., \$15,900. 661/294-3857.

'80 BMW 633 CS, good cond., ~125,000 mi., white, 2-door coupe, \$2,500/obo. 790-6185, Tim.

'95 CHEVORLET Camaro, silver, t-tops, V6, 5 spd, manual, 80K mi., exc. cond., \$8,000. 352-2380.

'01 FORD Escape XLT, 4 x 4, 3.0L V6, all options except side step bars, mocha inter/ext., 27K mi., exc. cond., 2 new tires, \$19,900. 626/584-3841.

'98 FORD Ranger XLT, great cond., wht, 2 dr., V6, 4.0, 83K mi., 6" body lift, off road tires, custom brush guard, pwr. everything, a/c, ABS, am/fm/cass., bedliner, tow hitch, spotlight, e-mail code3media@crownvic.net for link to photos, \$13,000/obo. 822-6465. **'87 FORD F-250 PU**, 460cid, V8, 4:10-1 diff. auto, a/c, am/fm, PS/PB, cruise, new tires, 5th wheel hitch/bed cover, 43K mi., good cond., strong tow veh., records available, renewed lic.-Jan. cab top air foil, smog test, \$5,000/obo. 626/963-5727.

'68 FORD Ranchero, 390 w/auto, GT package, red w/blk interior, bucket seats, console, 95% restored, incl interior, paint, engine, trans, suspension, GT wheels and stripes, \$6,700/obo. 952-8984.

'67 FORD Mustang 390, 4-speed S Code coupe, Ford Blue exterior, new interior, great cond., must see, \$6,500/obo. 626/339-9353, Greg.

'00 HONDA Civic SI, black, OEM high wing, 19K mi., \$17,000/obo. 661/255-5645.

'00 HONDA Odyssey LX V6, 3.5, beige, auto, a/c, am/fm/cass, 44,700 mi., exc. cond., \$21,000. 626/447-0466.

'00 HONDA Odyssey EX, 3.5 V6, auto, A/C, in-dash CD, CD changer, electric rear doors, 44,400+ mi., \$23,500. 661/816-7799.

'73 HONDA XR75, runs, up to date license, spark arrestor, new rings, \$595/obo. 541-1858.

'00 HYUNDAI Accent GL, 31K mi., perfect service records, under warranty until 12/04, exc. cond., \$7,800. 626/578-1459.

'91 INFINITI G20, fair cond., \$2,800. 957-3675.

'91 ISUZU Trooper LS, V6, 2.8L, 4WD, white, 5 sp. manual, a/c, am/fm/cass, p/s, p/w, cruise control, orig. owner, 90,000 miles, new trans and clutch, VG cond., \$3,500. 626/398-0921.

'93 KAWASAKI Ninja, 600cc, black with purple, turquoise stripe down side, black leather tank cover, 16K mi., \$3,200/obo. 501-8161.

'85 KOUNTRY Lite 5th wheel trailer, 30 ft., orig. owner, aluim. frame, 13.5K mi., A/C, side bath, microwave, TV/VCP avail, new tires & water pump, sleeps 6., exc. cond., renewed lic.-Mar., \$8,000/obo. 626/963-5727.

'97 LINCOLN Mark VII coupe, 2 dr., perfect cond., black, all options,CD player/changer, leather dual power seats, premium wheels, 56,000 mi., make offer. 949/632-8632, Linda.

'96 MAZDA B2300, white, 5 spd., pick-up shell, exc. cond., 51K mi., Blue Book \$4,975/obo. 626/794-9200.

'92 NISSAN Maxima M2000, 4 dr., 113K mi., \$7,000. 562/463-0692, Cruz.

'96 RANGE ROVER 4.0 SE, black with tan inter, exc. cond., have all service records including a new computer module, \$19,000. 626/797-8929.

'86 SAAB 900 turbo, black, 5 spd., a strong performer on the road, a/c, moonroof, Nakamichi stereo, new tires, passed smog check, license till Aug., 2003, \$2,500. 626/312-5422.

'96 TOYOTA Corolla DX, 4 dr., 5 spd., all amenities, new tires, exc. cond, 137K mi., \$5,600/obo. 760/246-3825.

'89 TOYOTA Camry, sedan, 4 dr., automatic, 1 owner, A/C, front wheel dr, 4 cyl., 2.0 liter,

DR. EARLE HUCKINS III,

59, a top manager for the Office of Space Science at NASA Headquarters, died July 22 at his home in Centreville, Va., of complications from amyotrophic lateral sclerosis, often called Lou Gehrig's disease.

From February 1996 until November 2001, he served as deputy associate administrator for Space Science at Headquarters, responsible for the executive direction of NASA's space science flight program including missions such as the Hubble Space Telescope; the Chandra X-ray Telescope; and planetary missions including JPL's Mars Pathfinder, Mars Global Surveyor, Mars Odyssey, Galileo mission and Cassini missions. Huckins was also responsible



Dr. Earle Huckins

for the overall contract management of JPL.

He resigned as deputy in November 2001 because of his declining health, but continued working as a special assistant.

Huckins is survived by his wife, Cathy; daughter Christine; sons Scott and Brian; granddaughter Kelsey; and a forthcoming grandson, Connor. The family has requested that contributions be made to the ALS Association, National Capital Area Chapter.

Retirees

The following JPL employees retired in August: David Scaff, 43 years, Section 386; William Tibbitts, 43 years, Section 350; Eleanor Helin, 39 years, Section 322; Hiroshi Otake, 33 years, Section 345; David Rogers, 31 years, Section 303; John Peterson, 25 years, Section 661; Robert Deering, 18 years, Section 387.

good cond., clean, \$2,800/obo. 626/282-1821.

'99 VOLKSWAGEN Passat GLS, 4-dr. sedan, 1.8L Turbo, Tiptronic automatic, 51K mi., green metallic ext, beige leather int, CD stacker, sunroof, PW, PS, PDL, heated seats, great family car, below low Blue Book, \$16,000/obo. 790-3717, Jason or Gayle.

'87 VOLVO GLE 740, blue, 4 dr. sedan, power, cruise, runs well, in good cond., \$2,900. 789-0139.

Wanted

SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman.

VOLLEYBALL PLAYERS, coed, no beginners please, Tuesday nights 8 to 10:00 at Eagle Rock High School, \$3/night. 956-1744, Barbara.

Free

MULCH, save water, gd. for weed control & composting, Fire Dept. approved, great in gardens, builds healthy soil, free delivery to local JPL area, have tons. 626/798-6405, after 6.

For Rent

ALTADENA, condo for lease, min. from JPL, 2 bd., 1.75 ba., nice closets with organizers, fireplace, central a/c & heat, community pool, storage room, 2-car garage (carport), tile counter top and marble floor in kitchen, large patio with landscape, planters and oriental garden with waterfall and spa, end unit with windows on three sides, cable on, \$1,200. 626/398-1988.

ALTADENA house, 3 bd., near Lab north of Woodbury and east of Lincoln, redecorated and painted throughout, washer/dryer and stove, \$1,300, water and trash included. 323/871-1043.

ALTADENA apt., 5 min. from JPL, spacious 2 bd., stove and frig., A/C, \$1,100. 626/791-7355, Norman.

ALTADENA duplex, 3 mi. from JPL, large 2 story townhouse, 2 large bd., 1.5 ba., formal dining room, storage space, laundry hook ups, asking \$1,200. 626/791-7355, Norman.

GLENDALE, share 2 bd., 1 ba. house with fellow JPLer, laundry, yard, quiet neighborhood, 10 mi. to JPL, \$600 + 1/2 utilities. 507-5632.

LA CANADA/FLINTRIDGE, room, private bathroom, kitchen privileges, pool, BBQ, parking, 2 mi. to JPL. 952-5430.

LA CRESCENTA house, extra nice, 2 bd., 1 ba., fireplace, 5 min. from JPL, central heat, formal dining room, water and gardener inc., no smoking or pets, \$1,495. 805/659-1742.

MONROVIA HILLS, charming 2nd level of house w/a view, 2bd., 1.5 ba., kitchen w/refrigerator & electric stove, dining rm, living rm., master bd. w/walk-in closet, laundry rm. area, \$1,200 w/two-car garage or \$1,000 w/out garage. 626/256-0015.

NORTH ALHAMBRA studio, on 2nd St., water and electric included, \$600. 626/379-3503 or 626/688-1527.

NORTH ALAHAMBRA, 3 bd., 1 ba., living room, 2 car parking, walk to Main St., \$1,100. 626/379-3503.

PASADENA, 1 bd. in a 2 bd., 1 ba. house, all privileges, male preferred, no pets allowed, quiet area, walking distance from Caltech and PCC, \$325 deposit & 1st month rent is required, \$375 + utilities. 626/844-0425.

PASADENA condo, 2 bd., 2.5 ba., Caltech and Old Town, 1,350 sq. ft., sub-teran. parking, wash/dry hook-up, \$1,650. 626/836-9108.

PASADENA condo, 2 bd., 2 parking places, 125 Blanch Street, \$1,700. 626/798-3969, before 10:00 a.m. or after 8:00 p.m.

PASADENA, fully furnished, townhome-style apartment, 2 bd., 1.5 ba., with A/C, new carpet and flooring, small patio, laundry facility and parking, \$1,250 plus utilities; 2 bd., **PASADENA** apt., 1.5 ba., to share with student, furnished, a/c, laundry facility, parking, \$625 plus utilities, both are close to Caltech & PCC, 7 mi. to JPL. 626/351-9641.

PASADENA guest house, above Eaton Cyn. golf course, beautiful setting, about 1,000 sq. ft., washer & dryer, ideal for 1 person with a very quiet lifestyle, \$895 plus util. 626/798-4056.

PASADENA, large condo in centrally located complex, 2 bd, 2 ba, office, separate kitchen,

1 mile from Caltech, furnished, 1-yr. lease, available 9/1, \$2,500. 626/793-1473.

PASADENA, near Caltech, very nice, large, 2 bd., 2.5 ba., hardwood floors, fireplace, patio, a/c, washer/dryer, refrig. stove, new carpet, 2 car parking, \$1,600. 626/441-6955.

PASADENA, spacious 2-story condo, 3 bd., 2.5 ba., prestigious community, beaut. inter., bright kitch., prof. landscape, ctrl. air/heat, close to shops/schools, cozy l/r w/FP, end unit, frml. d/r, hdwd. flrs., immac. cond., \$1,750. 626/396-9024.

SIERRA MADRE, small, charming 2 bd. home, 1 ba., carpeted, stove, laundry room, storage, fenced yard, flowers, great neighborhood, water and trash included, 15 min. from JPL, avail. Aug. 15, \$1,275. 626/355-3492

SIERRA MADRE, townhouse-style apt. to share, nr dwntwn, large patio, 12 x 12 ft. pvt. Bd., quiet tree-lined street, garage pkg, no smoking, no pets, \$650 + 1/2 util. 626/796-2070, Heather.

Real Estate

ALTADENA, for sale by owner, 3 bd., 1 ba., 1,108 sq. ft., 7668 sq. ft. lot, 2 car detached garage w/laundry facilities, \$285,000 or make offer. 800/836-8750 ext. 10020.

CLAREMONT house, 4 bd., 2.5 ba., 2,600 + sq. ft., 3-car attached garage, located north of Baseline, recently upgraded kitchen, \$446,500. 909/624-1051.

COLORADO, 10+ level acres near Rio Grande, NM border, two adjacent 5-acre lots on St. Hwy. 248, sell one or both for \$1K/acre obo. 626/254-1550.

GLENDALE, East Ridge Estates (Eagle Rock area), 1,979 sq. ft., 5,700 sq. ft. lot, 3 bd., 2.5 ba., dining/living view of pool, kitchen, breakfast area, family room facing patio, tile roof, central air/heat, alarm auto sprinklers, cable, etc., built in 1963. 323/256-0535.

PASADENA, Rose Bowl area, 1910 Craftsman/Victorian transitional, 5 bd., 2 ba., large attics, Cal basement, dual zone, a/c, lg. kitchen, many built-ins, fully restored, \$585K. 626/584-3841.

Vacation Rentals

BALBOA ISLAND, fully furnished, 2 bd., 1 ba., sleeps 4, dishwasher, microwave, TV, covered patio, parking, laundry facilities, steps to bay, quiet location, available weekly during the summer, \$1,200-\$1,500/week. 626/351-9641.

BIG BEAR LAKEFRONT, luxury townhome, 2 decks, tennis, pool/spa, beautiful master bd. suite, sleeps 6. 949/786-6548.

CAMBRIA, ocean front house, sleeps up to 4, exc. view. 248-8853.

HAWAII, Kona, ocean front on Keauhou Bay, house and guest house comfortably sleep 6, 3 bd., 2 ba., rustic, relaxing and beautiful, swimming, snorkeling, fishing, spectacular view, near restaurants, golf and other attractions. 626/584-9632.

HAWAII, Maui condo, NW coast, ocean front view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn. phone, color TV, VCR, microwave, d/w, pool, priv. lanai, slps 4, laundry fac., 4/15-12/14 \$105/nite/2, 12/15-4/14 \$120/nite/2, \$15/nite/ add'l person. 949-348-8047, jackandrandy@cox.net.

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equipped kitchen incl. microwave, D/W, cable TV, VCR, phone, balcony w/view to mtns., Jacuzzi, sauna, streams, fishponds, close to Mammoth Creek, JPL discount. 626/798-9222 or 626/794-0455.

OCEANSIDE condo, fully furn., 2 bd., 2 ba., fireplace, full kitch., quiet, relaxing, beautiful beachside setting; BBQ, pool, spa, game rm.; great ocean view, easy walk to pier / restaur., sleeps 8, aval. weekly or monthly, 909/981-7492 or dfhauge@yahoo.com, Darlene.

OCEANSIDE, on the sand, charming 1 bd. condo, panoramic view, walk to pier & harbor, pool/spa, game rm., sleeps 4. 949/786-6548.

PUERTO VALLARTA, Villa del Mar, lg. studio, sleeps 4 max, rooms have microwave, kitchen, phones, cable TV, private patio, 3 pools, 3 restaurants, spa, private beach, charming town, top-rated resort, available only 12/28/02 - 1/4/03, on-site New Year's Eve Fiesta, see at http://www.myuvc.com/puerto_vallarta.shtm. 541-1340.

ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906.